

WHAT IS CLAIMED IS:

1. A method of lyophilizing material, comprising the steps of:
- placing material to be processed in a chamber under temperature and pressure
- 5 conditions facilitating lyophilization;
- creating a microwave field in the chamber;
- taking temperature measurements in the chamber;
- controlling microwave power and duration to vary microwave field strength in
- response to temperature measurements;
- 10 trapping water vapor extracted from the material being dried.

2. A method according to claim 1, wherein the step of trapping water vapor
- comprises passing the water vapor through a condenser.

3. A method according to claim 1, wherein the step of trapping water vapor
- comprises passing the water vapor to or through a desiccant.

4. A method according to claim 1, comprising the further step of stirring the
- microwaves in the field to facilitate improved microwave dispersion in the chamber.

5. A method according to claim 1, comprising the further step of shielding selected
- surfaces in the chamber from direct exposure to microwaves.

6. A method of lyophilizing, comprising the steps of:
placing material in a lyophilizing chamber, the chamber having a controllable temperature and pressure;

creating chamber conditions to facilitate sublimation;

5 wherein in a first operating mode, the chamber utilizes temperature and pressure to facilitate sublimation, in a second mode, the chamber utilizes temperature, pressure and microwaves to facilitate sublimation, and in a third mode utilizes only microwaves to facilitate sublimation.

10 7. A method according to claim 6, wherein processing includes operation in a combination of two or more of the first, second and third modes.